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Cox

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(54) **STYLETS FOR USE WITH APPARATUS FOR INTRAVASCULAR PLACEMENT OF A CATHETER**

(56) **References Cited**

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(57)

ABSTRACT

An integrated catheter placement system for accurately placing a catheter within a patient's vasculature is disclosed. In one embodiment, the integrated system comprises a system console, a tip location sensor for temporary placement on the patient's chest, and an ultrasound probe. The tip location sensor senses a magnetic field of a stylet disposed in a lumen of the catheter when the catheter is disposed in the vasculature. The ultrasound probe ultrasonically images a portion of the vasculature prior to introduction of the catheter. ECG signal-based catheter tip guidance is included in the integrated system to enable guidance of the catheter tip to a desired position with respect to a node of the patient's heart. Stylets and catheters including various multiple bipolar and monopolar electrode configurations are also disclosed.

Related U.S. Application Data

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(58) **Field of Classification Search**
USPC 600/509, 585
See application file for complete search history.

12 Claims, 81 Drawing Sheets

